

FC20&EC2x

Reference Design

Wi-Fi&BT/LTE Module Series

Rev. FC20&EC2x_Reference_Design_Rev.A

Date: 2016-08-23



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About the Document

History

Revision	Date	Author	Description
A	2016-08-23	Power JIN	Initial

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1 Reference Schematics

1.1. Introduction

FC20 Wi-Fi & BT module is designed to be used in combination with Quectel EC2x series modules, so as to provide customers with Wi-Fi+BT+LTE one-stop solution. Quectel EC2x series modules include EC21, EC25, and EC20 R2.0.

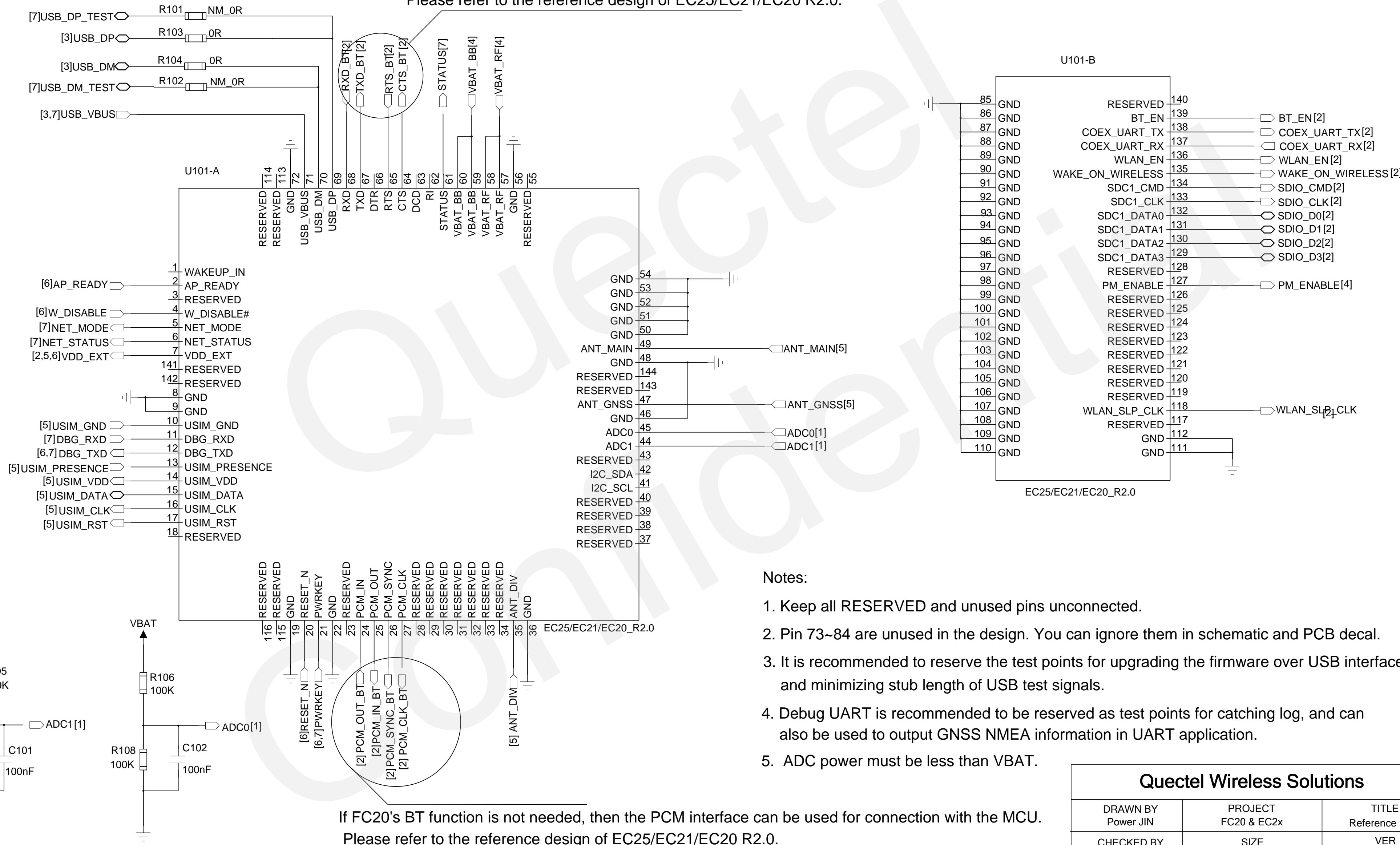
This document is a reference design for Quectel FC20 and EC2x series modules when they are used together for applications.

1.2. Schematics

The schematics illustrated in the following pages are provided for your reference only.

EC2x Module Interface Design

If FC20's BT function is not needed, then the UART interface can be used for connection with the MCU.
Please refer to the reference design of EC25/EC21/EC20 R2.0.



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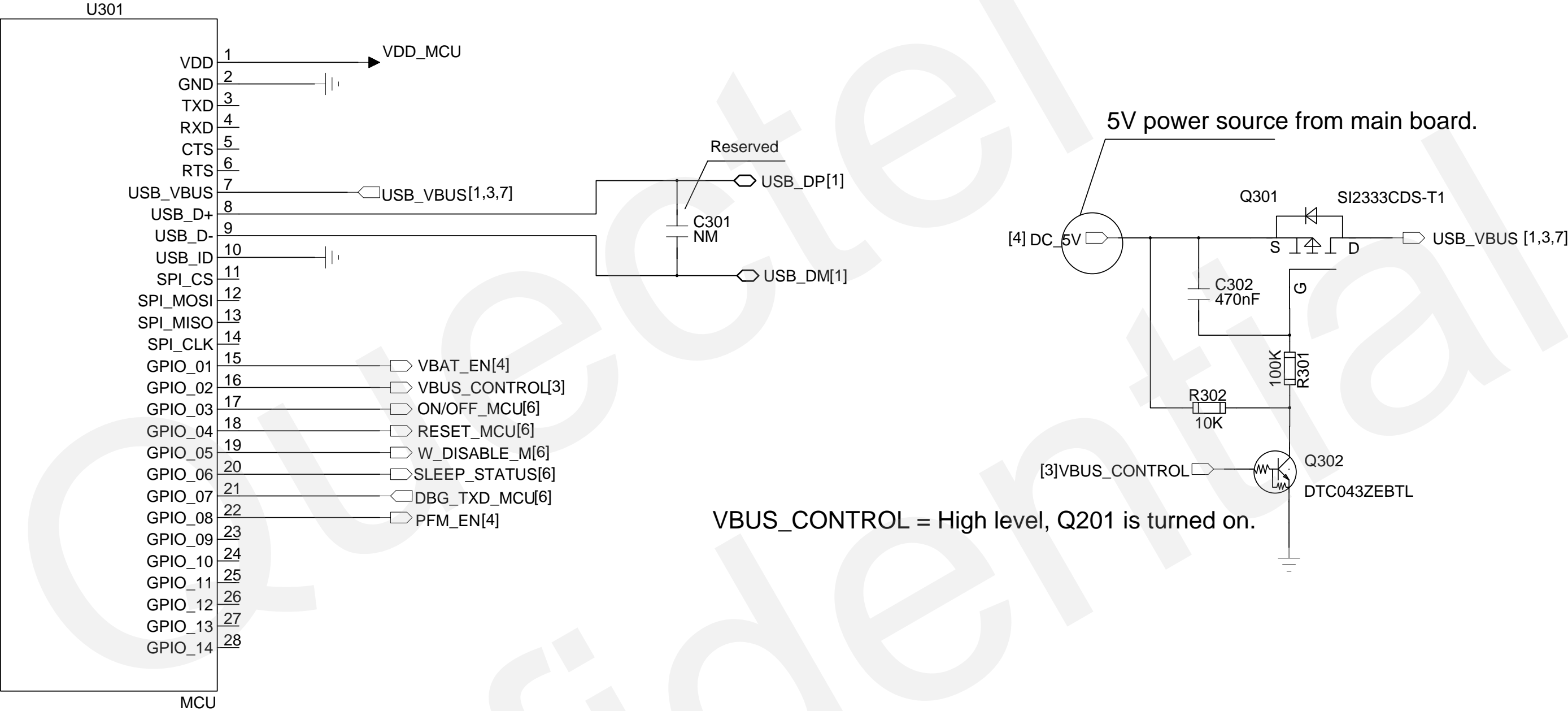


B

- A

A

MCU Interface



Notes:

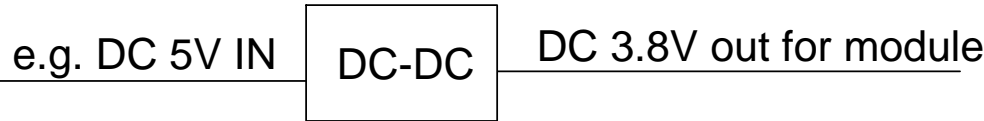
1. Assume MCU U301 has 3.3V GPIO logic level, and some GPIO's level shift are ignored here.
2. EC25/EC21/EC20 R2.0 can only work as a USB device and supports FS/HS mode. To communicate with USB interface, MCU U201 needs to support USB host or OTG function. The VBUS pins of MCU and EC25/EC21/EC20 R2.0 need to be powered by a 5V power system for USB detection, and VBUS_CONTROL turns on and off VBUS power supply.
3. AP_READY is used for sleep application. For more details, please refer to the document **Quectel_EC25/EC21/EC20_R2.0_Hardware_Design**.
4. DBG_TXD_3V3 is used to receive GNSS NMEA info when MCU does not support USB interface.

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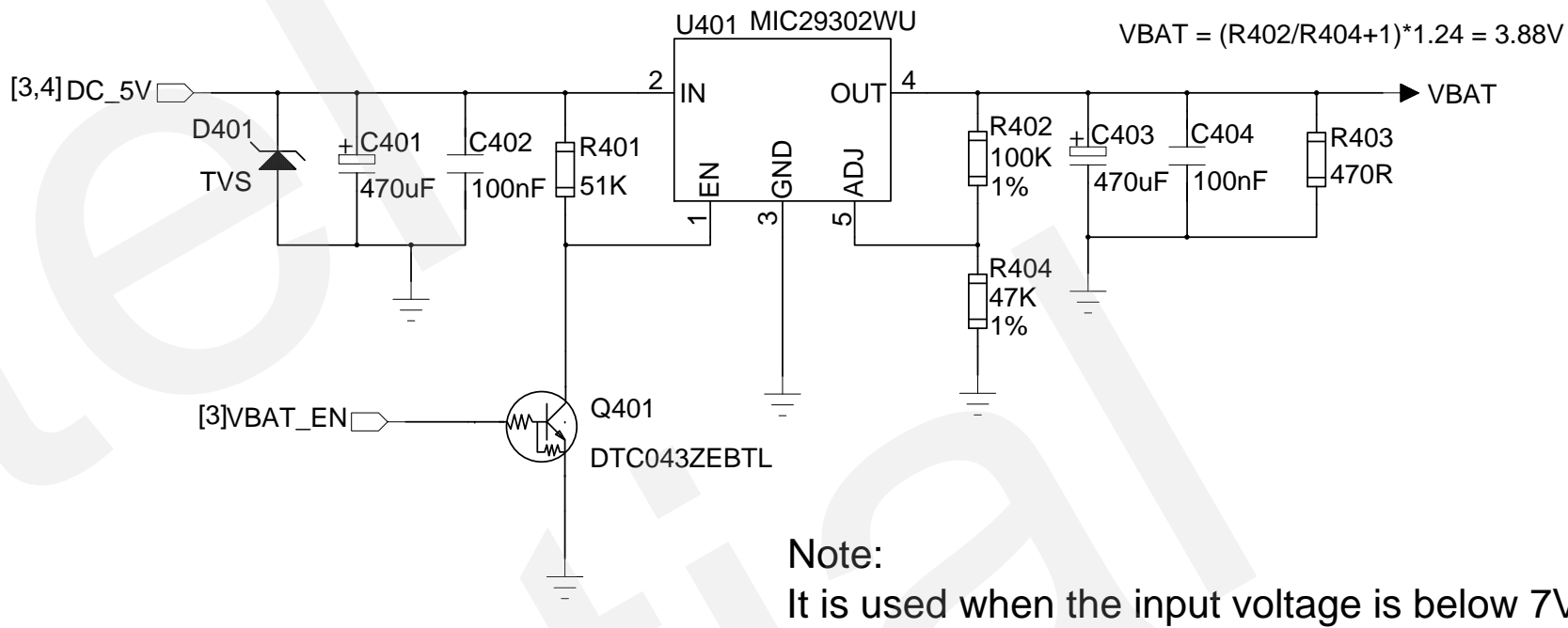
Power Design

DC-DC Application

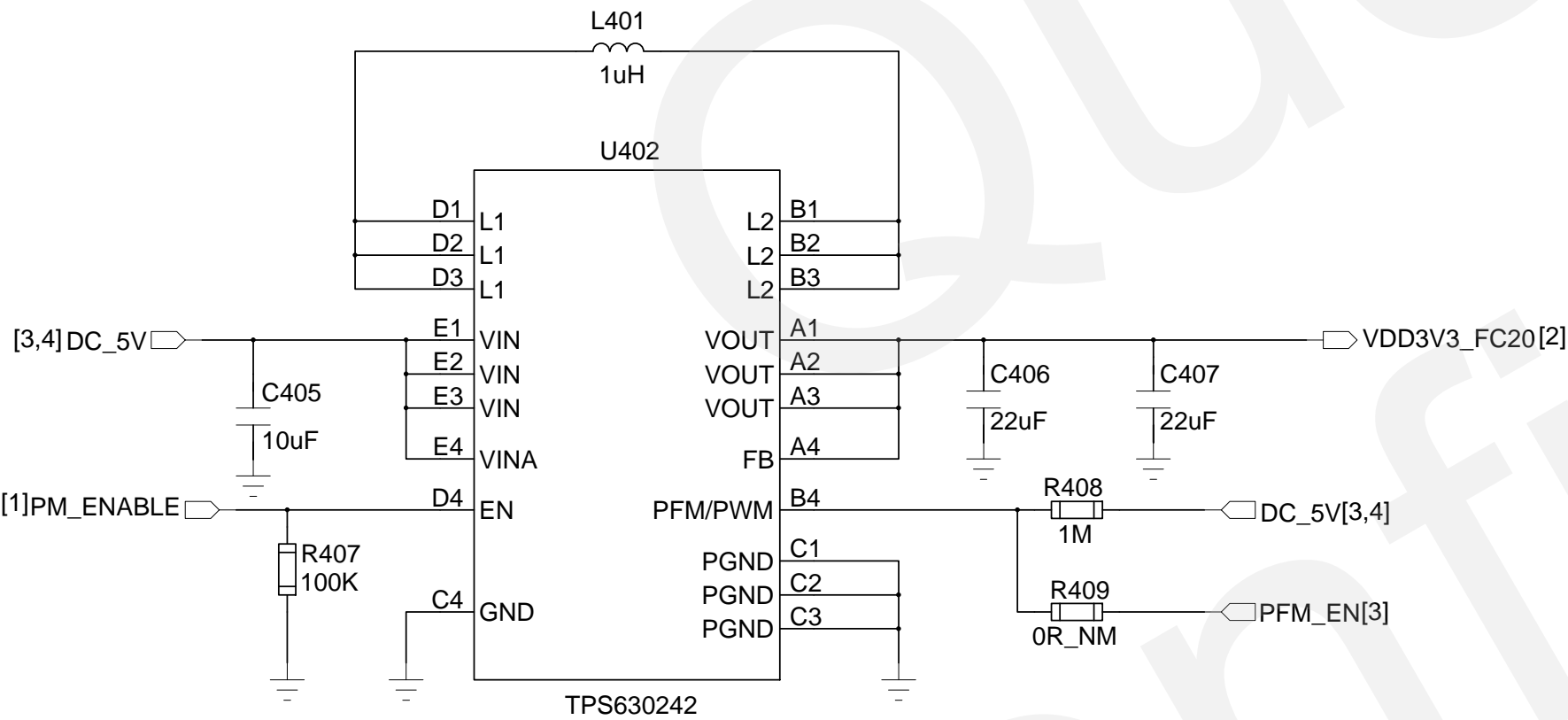
Use DC-DC converter to convert 5V input voltage to 3.8V output voltage for the module.



Supply Power to EC25/EC21/EC20 R2.0

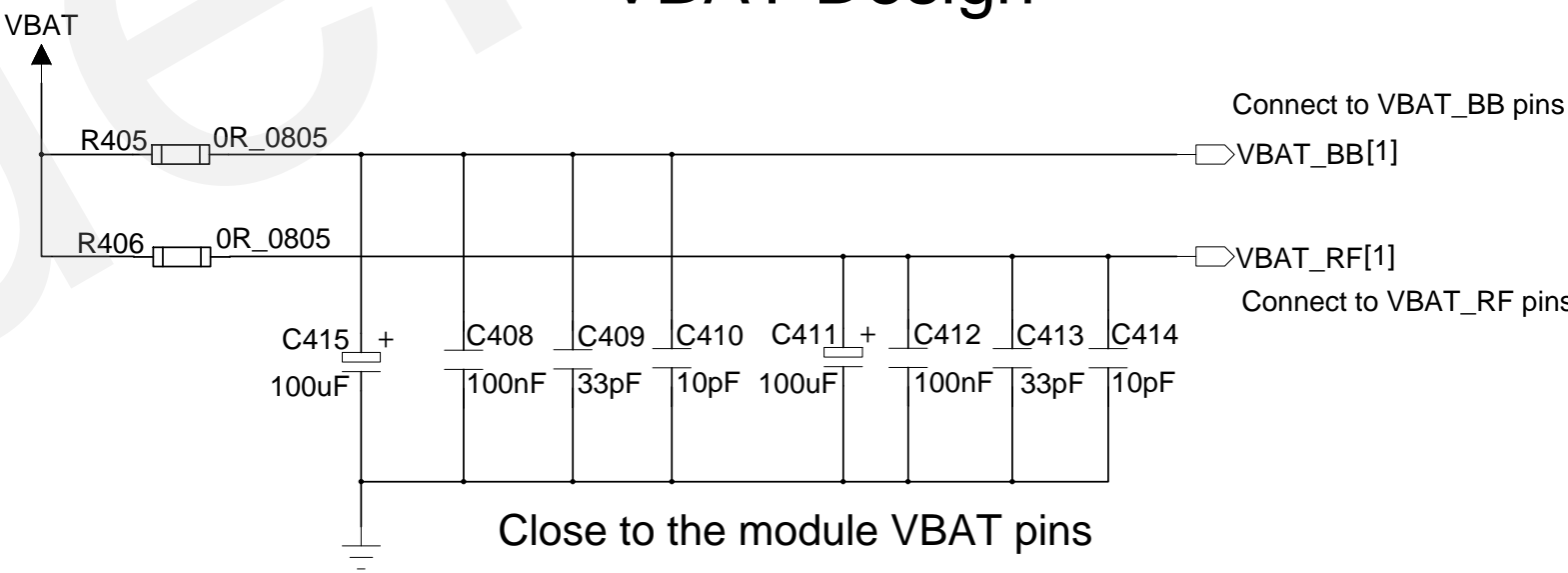


Supply Power to FC20



Note:
FC20's power supply needs 1.2A current at least.

VBAT Design



Note:
VBAT should be routed in star mode to VBAT_BB and VBAT_RF pins.

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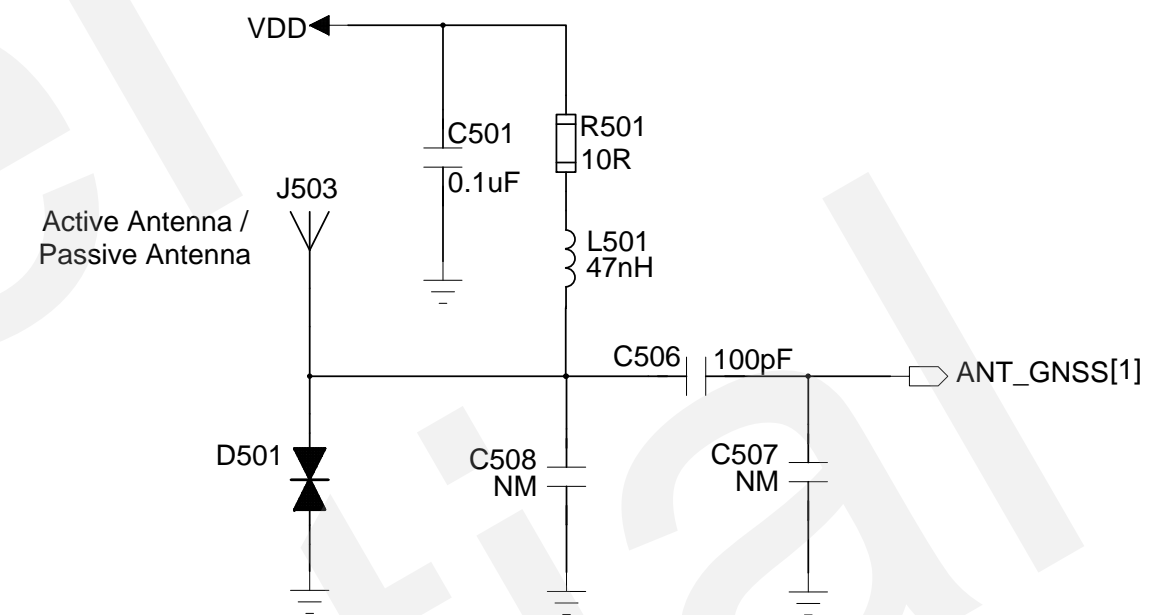
C



A



The schematic diagram illustrates the FC20 antenna circuit. A WLAN Antenna (J505) is connected to a network of components. The circuit includes a resistor R509, a 0R resistor, and two capacitors, C513 and C514, all connected to ground. The output of the network is connected to the FC20_ANT [2] connector.

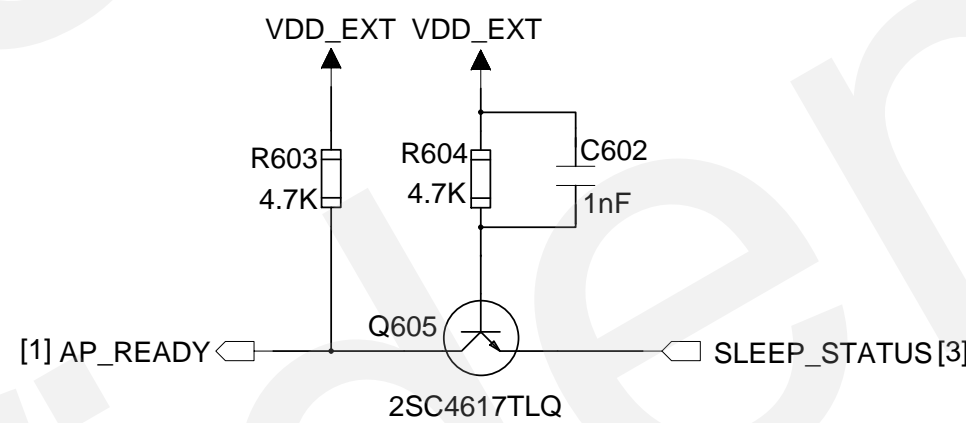
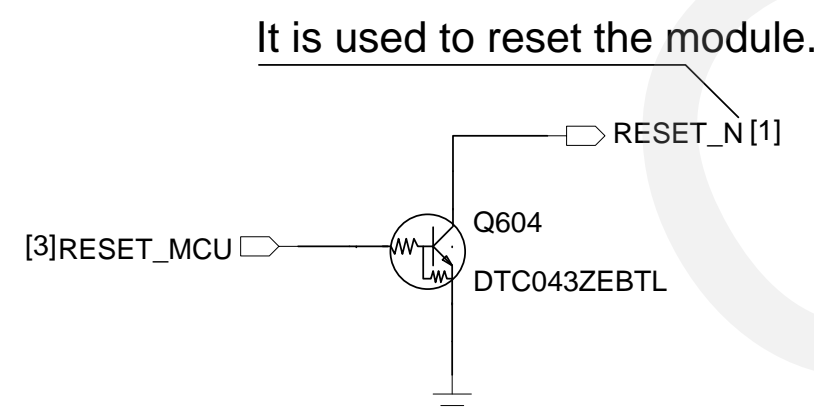
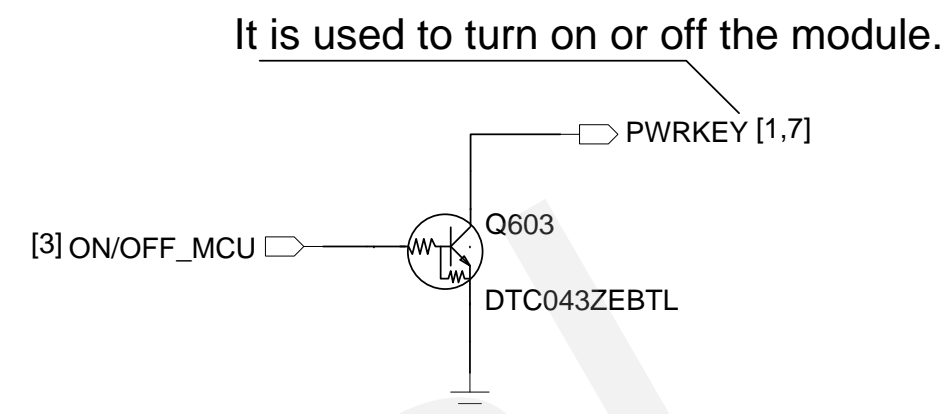
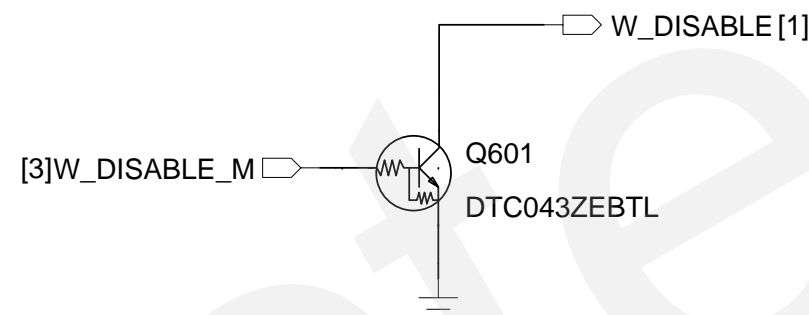
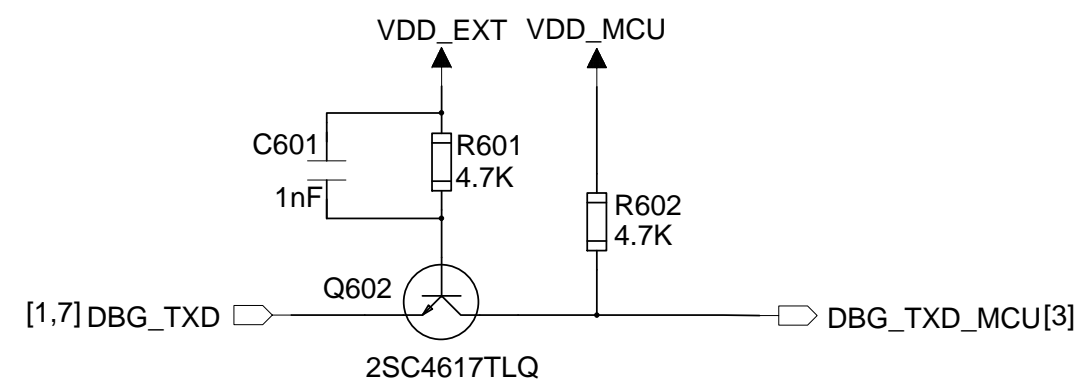


Notes:

1. R506~R508 are applied to suppress the EMI spurious transmission and enhance the ESD protection.
2. R504 can improve anti-jamming capability of the USIM circuit.
3. EC25/EC21/EC20 R2.0 supports USIM card hot-plugging, which can be implemented through USIM_PRESENCE pin.
The pin supports low level and high level detection, and it is disabled by default.
The circuit above is designed for low-level detection.
4. The value of C509 should be less than 1uF.

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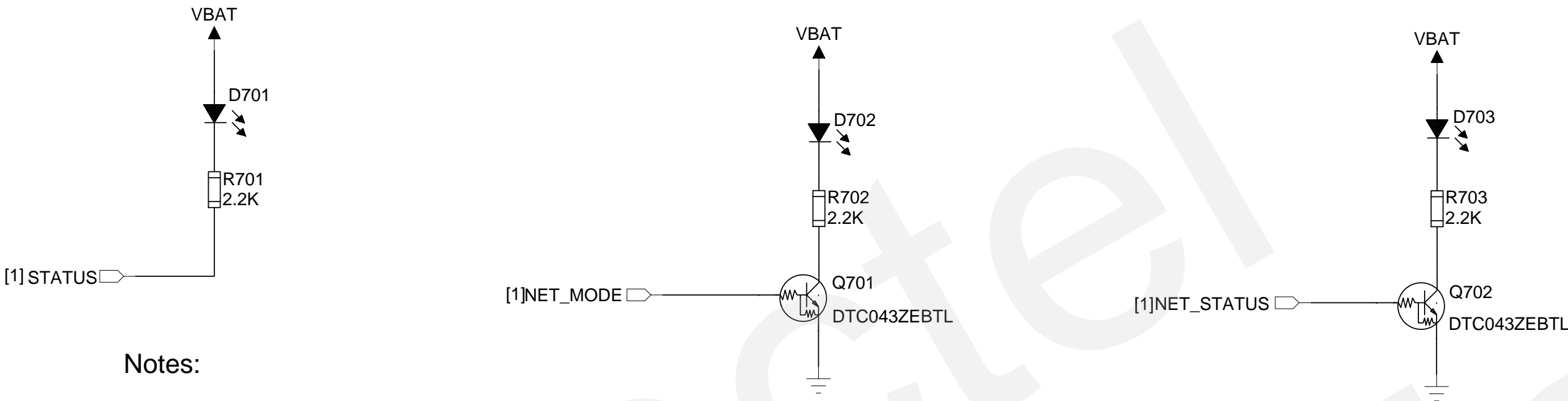
Level Shift Design



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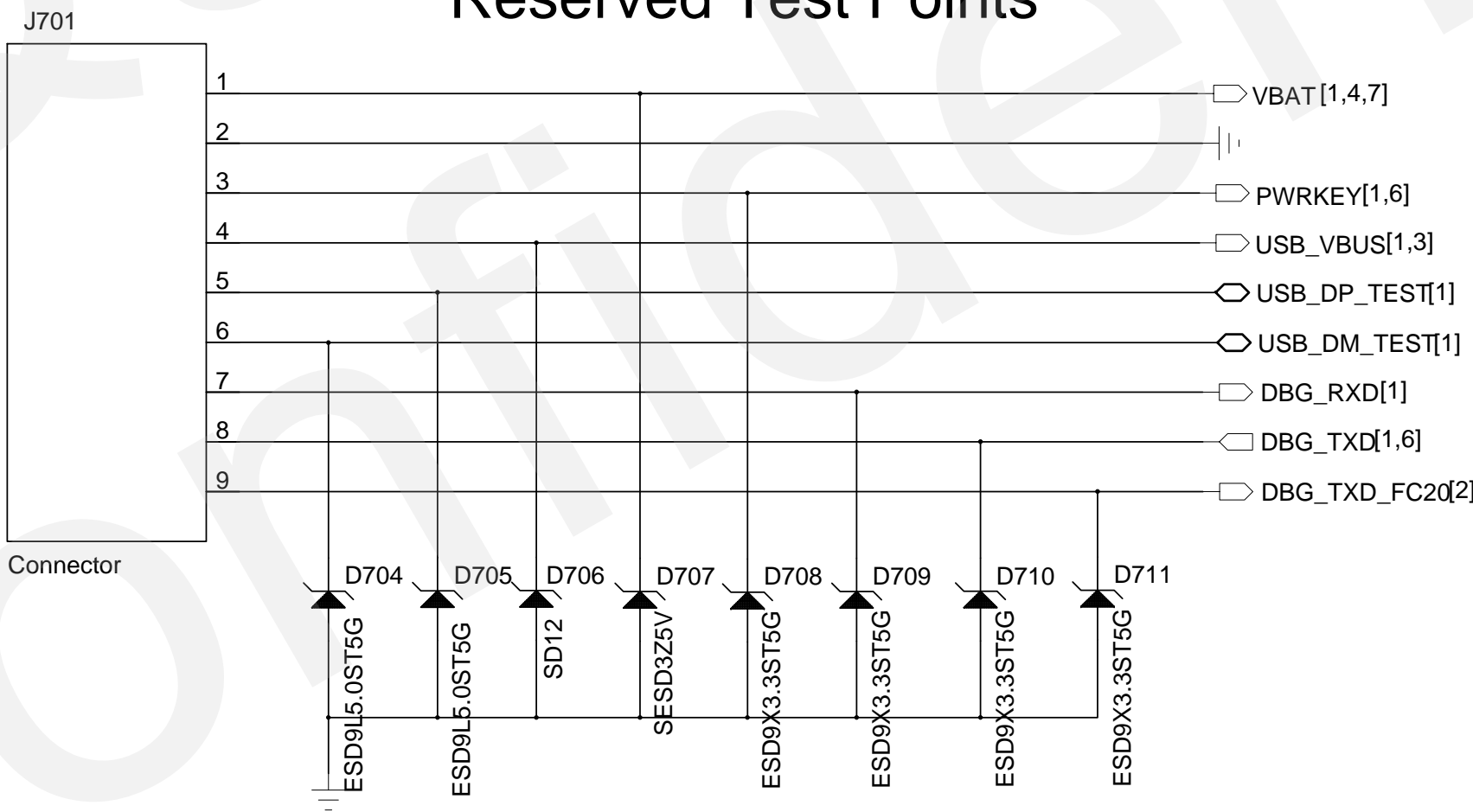
Other Designs

Indicators



- Notes:
- 1. Module STATUS is open drain output.
 - 2. For more details about NET_MODE and NET_STATUS, please refer to the document **Quectel_EC25/EC21/EC20_R2.0_Hardware_Design**.

Reserved Test Points



- Notes:
- 1. Both USB and debug UART interfaces are reserved for EC25/EC21/EC20 R2.0 software debug.
 - 2. USB interface can be used to upgrade firmware for EC25/EC21/EC20 R2.0.
 - 3. Keep USB test points as close to USB pins as possible.

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